

REMARKS

Claims 1-11, 13-28, 30-34, 36-46 and 48-56 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,446,176 to West et al. ("West"), in view of U.S. Patent No. 6,643,671 to Milillo et al ("Milillo").

Claims 1-11, 13-28, 30-34, 36-46, and 48-56 remain pending.

Rejection of Claims 1-11, 13-28, 30-34, 36-46, and 48-55 under 35 U.S.C. Section 103(a)

Applicants respectfully disagree with the characterization and interpretation of the references cited and discussed in the Office Action. Because the references do not, in fact, describe what is alleged in the Office Action, applicants submit that the combination of these references is improper and that the section 103(a) rejections are defective.

With respect to independent claim 1, the Office Action states that West teaches a system for synchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link. The Applicant's invention that is disclosed in claim 1 recites asynchronously transmitting database updates from a primary site to a remote site.

With respect to independent claim 18, the Office Action states that West teaches a system for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link. The Office Action further states that at col. 7, lines 38-39, West teaches that not only the "return of status information" but also the "transfer of data" may occur asynchronously, and update to the database incorporates transferring data.

Applicant submits that the cited passage has been misinterpreted. The cited passage

states: "In other words, the transfer of data and the return of status information may occur asynchronously." This passage has been mistakenly interpreted to mean that the transfer of data may occur asynchronously, and the return of status information may occur asynchronously. However, the correct interpretation of this passage is that the transfer of data and the return of status information may occur asynchronously with respect to each other. In other words, the transfer of data is asynchronous with the return of status information.

For example, West states: "In general, the data transfers proceed with normal status while the true success or failure status is sent asynchronously on a separate transmission back to the primary system." (See col. 6, lines 11-14). Therefore, the status is asynchronous with respect to the data transfers. Furthermore, it is clear that West is only concerned with peer-to-peer remote copy (PPRC), which is a synchronous copy mechanism. (See col. 1, lines 9-15 and lines 28-44) In particular, West states that "The present invention relates generally to peer-to-peer remote copy (PPRC) methods and systems...", (See col. 1, lines 9 and 10). Moreover, West further states "Peer-to-peer remote copy (PPRC) is a synchronous copy mechanism that creates a copy of data at a remote or secondary storage system." (See col. 1, lines 28-30).

With respect to independent claim 36, the Office Action states that West teaches a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link (col. 4, lines 51-52, lines 64-67; col. 5, lines 1-3). The passages cited only discuss a storage system. Nothing is mentioned about asynchronously transmitting database updates from a primary site to a remote site.

West does not teach or suggest the system recited in claims 1, 18, and 36. Specifically,

West at least does not teach or suggest asynchronously transmitting database updates from a primary site to a remote site. Instead, West teaches a system and method for transferring data between primary storage and secondary storage using a synchronous copy mechanism.

With respect to independent claims 1, 18, and 36, the Office Action states that Milillo teaches a system and method for synchronizing a data copy using an accumulation remote copy trio consistency group. The Office Action also states that Milillo discloses using a "trio" of a source volume, primary target volume, and a secondary volume (Figs. 2 and 4). However, the Office Action further states that Milillo teaches performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at a remote site (col. 2, lines 7-14 and col. 3, lines 1-33). Applicant submits that the cited passages have been misinterpreted.

The passage cited at col. 2, lines 7-14 discusses migrating a point-in-time copy of data from a source volume to a secondary volume in a PPRC pair. There is no mention of a point in time virtual copy of modified data of a third volume to a fourth volume. Milillo then refers to a system for snapshot copying from a simplex source to a PPRC volume pair by only sending data indicated by accumulated write commands to a secondary system rather than sending the entire source volume (col. 2, lines 31-42). The passage cited at col. 3, lines 1-33 indicates that such a system could be used in storage systems that comprise multiple source volumes that are to be migrated to a secondary storage system also having multiple volumes. Thus, this passage is only stating that multiple source volumes at a primary subsystem can be migrated to multiple corresponding volumes at a secondary subsystem (Fig. 2), but there is no disclosure or suggestion of performing a second point in time virtual copy of modified data of a third volume that is at a remote site to a fourth volume that is also at the remote site, as claimed by the Applicant.

Further, to rebut Applicant's previous argument that there is no disclosure or suggestion of the use of four volumes as set forth in Applicant's claims, a passage at col. 15, lines 24-31 of Milillo has been cited in the Office Action (see pages 21-22, paragraph 4). This cited passage states: "While the present invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing description."

Moreover, the Office Action states that "It would be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention, such as adding a fourth volume." However, one cannot base obviousness upon what a person skilled in the art could, or might, try but rather must consider what the prior art would have led a person skilled in the art to do. In re Antonie, 559 F.2d 618 195 USPQ 6 (CCPA, 1977). The Examiner must make a showing of a suggestion or motivation in the art to combine the references. In re Rouffet, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998). The Examiner has failed to make such a showing, and the conclusion asserted only represents an impermissible use of hindsight gained from the present invention. In fact, the cited passage is only boilerplate that is seen in most patent applications. The passage provides no specific teaching whatsoever.

Milillo does not teach or suggest the system recited in claims 1, 18, and 36. Specifically, Milillo at least does not teach or suggest performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at a remote site. Instead, Milillo teaches a system and method for synchronizing a data copy using an accumulation remote copy trio consistency group, which includes a source volume, primary target volume, and a secondary volume.

In view of the foregoing, it is respectfully submitted that West and Milillo, whether taken alone or in combination, do not teach or suggest the subject matter recited in claims 1, 18, and 36, as each of these references fails at least to teach or suggest a system and method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, where the primary site includes a first volume and a second volume, and the remote site includes a third volume and a fourth volume. Further, the system and method of the claimed invention includes a means to perform a first point in time virtual copy of modified data of the first volume to the second volume at the primary site, and a means to perform a second point in time virtual copy of modified data of the third volume to the fourth volume, which is at the remote site.

Claims 2-11, 13-17, 19-28, 30-34, 37-46, and 48-55, which depend directly or indirectly from the independent claims 1, 18, and 36 incorporate all of the limitations of the corresponding independent claim and are therefore patentably distinct over West in view of Milillo for at least those reasons provided for claims 1, 18, and 36.

Rejection of Claim 56 under 35 U.S.C. Section 103(a)

The Office Action states West teaches that during synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site (abstract; col. 1, lines 45-52, lines 58-67; col. 2, lines 1-2, 17-24).

The passages cited refer only to a host writing data to primary storage system and a secondary storage system. Nothing related to a fourth volume is described. Applicant's invention teaches writing data from a first volume to a second volume, from the second volume to a third volume, and from the third volume to a fourth volume, which is at a remote site.

West does not teach or suggest the system recited in claim 56. Specifically, West at least does not teach or suggest a first volume being accessible to a host at the primary site and a fourth volume being accessible to a host at a remote site. Instead, West teaches a system and method for transferring data between primary storage and secondary storage using a PPRC synchronous copy mechanism.

Milillo has been previously discussed above and does not teach or suggest the system recited in claim 56. Specifically, Milillo at least does not teach or suggest performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at a remote site. Instead, Milillo teaches a system and method for synchronizing a data copy using an accumulation remote copy trio consistency group, which includes a source volume, primary target volume, and a secondary volume.

In view of the foregoing, it is respectfully submitted that West and Milillo, whether taken alone or in combination, do not teach or suggest the subject matter recited in claim 56, as each of these references fails at least to teach or suggest a system and method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, where the primary site includes a first volume and a second volume, and the remote site includes a third volume and a fourth volume. Further, the system and method of the claim invention includes a means to perform a first point in time virtual copy of modified data of the first volume to the second volume at the primary site, and performing a second point in time virtual copy of modified data of the third volume to the fourth volume, which is at the remote site.

Conclusion

In view of the foregoing, applicants respectfully requests reconsideration, withdrawal of all rejections, and allowance of all pending claims in due course.

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